Health Consultation

(Exposure Investigation)

Exposure Investigation Workplan Indoor Air Quality: United Rentals
Hamilton/Labree Roads Groundwater Contamination Site
Chehalis, Lewis County, Washington
EPA FACILITY ID: WASFN1002174

November 12, 2002

Prepared by

The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Washington State Department of Health

Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. Health consultations focus on specific health issues so that DOH can respond quickly to requests from concerned residents or agencies for health information on hazardous substances. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this Health Consultation, please call the health advisor who prepared this document:

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Purpose

The Washington State Department of Health (DOH) is conducting an exposure investigation to evaluate whether people working above an area of contaminated groundwater (known as the Hamilton/Labree Roads Groundwater Contamination Site, or "site") are being exposed to harmful levels of chemicals that have the potential to migrate into indoor air. The purpose of this health consultation is to develop a protocol that outlines the exposure investigation's objectives and tasks. A separate health consultation will be prepared that will evaluate the results of the indoor air sampling analysis.

Background and Statement of Issues

Environmental testing since 1993 has revealed tetrachloroethylene (PCE) and other volatile organic compounds (VOCs) in drinking water wells, groundwater, and soil at the Hamilton/Labree Roads site. The site is located about three miles south of Chehalis, Washington near the intersection of Hamilton and Labree Roads in Lewis County. An aquifer system, which includes a shallow and a deep aquifer, is situated underneath the site. PCE has been measured as high as 3,740 ppb in drinking water and as high as 190,000 ppb in groundwater; reportedly, the highest levels of PCE found in drinking water and groundwater in the state. The drinking water standard for PCE is 5 ppb. Other VOCs have also been detected, but at considerably lower levels, and less frequently. Affected well owners are receiving bottled water, which was first provided by the Washington State Department of Ecology (Ecology). The Environmental Protection Agency (EPA) is currently supplying the bottled water and continues to monitor the area. A water treatment system was installed at one residence.

In July 2000, the EPA listed the Hamilton/Labree Road groundwater contamination area to its National Priorities List (NPL), and assumed lead agency status. Since then, EPA has conducted additional environmental investigations to determine the extent of contamination and if source removal is appropriate. In summer 2002, EPA began installing a new water line to area residences and businesses affected by contaminated groundwater. The line is expected to be completed by October 2002, and will give people an opportunity to connect to a permanent source of clean, safe water. During this time, EPA will also begin planning a removal action for one of the two identified PCE source areas.

Two primary sources of groundwater contamination have been identified; one northeast of the intersection of Hamilton and Labree Road, near the Bulldog Trailer building, and the other between Hamilton Road and Interstate-5 (I-5), across from the United Rentals property. Only wells in shallow aquifer (0 to 50 feet below ground surface) have been impacted. Deeper wells have not shown contamination. Investigations are ongoing to better define the extent of groundwater contamination.

Indoor air modeling

Air modeling conducted by DOH indicated the potential for PCE and PCE degradation products to migrate from the groundwater to indoor air at several locations in the vicinity of the two PCE source areas.

Locations considered by DOH and EPA to be at greatest potential risk include United Rentals and a private residence. Approximately 12 people work at United Rentals, which is located at 281 Hamilton Road. PCE levels in the United Rentals drinking water well have ranged from 122 ppb to 930 ppb, and from hundreds to thousands of ppb in adjacent monitoring wells. One boring just across the road from United Rentals recorded PCE levels as high as 190,000 ppb in the shallow aquifer, reportedly, the highest level ever measured in the state. The private residence is located near the intersection of Hamilton and Labree Roads, and has recorded PCE levels up to 3,740 ppb in their drinking water well, and hundreds to thousands of ppb in nearby shallow aquifer monitoring wells.

DOH contacted the residents and business to request indoor air sampling in order to assess whether PCE and related VOCs are present at levels of health concern. Although the residents chose not to participate in the sampling, United Rentals agreed to participate.

Table 1. Maximum concentrations of chemicals detected in soil, groundwater, and drinking water at or near subject locations
Hamilton/Labree groundwater contamination site, Chehalis, Washington *

Chemical	United Rentals			Private Residence (PW-9)		
	Media			Media		
	Soil	Groundwater (µg/liter)	Drinking Water (µg/liter)	Soil	Groundwater (µg/liter)	Drinking Water (µg/liter)
Tetrachloroethylene (PCE)	53 ppm	190,000 (boring) 61,000 (MW)	122 - 930	2 ppb	2,100	3,740
Trichloroethylene (TCE)	14 ppb	393	3	ND	ND	37
Cis 1,2-Dichloroethylene (DCE)	14 ppb	100	?	ND	ND	21
Vinyl Chloride	ND	68 (across street)	ND	ND	ND	0.47

ppm = parts of chemical per million parts of soil
ppb = parts of chemical per billion parts of soil
µg/liter = microgram of chemical per liter of water (equals part per billion)
ND = not detected

* This table was included in the exposure investigation workplan to develop contaminants of concern for the indoor air pathway only. As a result, health comparison values are not listed. Contaminant concentrations as of spring 2002.

Discussion

Exposure Pathways

VOCs in soil and groundwater can migrate upwards into the indoor air of overlying structures, where people can become exposed. Because considerable dilution occurs when the groundwater contaminants are released into outdoor air, it is unlikely that people are being exposed to harmful levels of VOCs outdoors. As a result, outdoor air is not considered a significant exposure source, and will not be sampled as part of this exposure investigation.

Exposure Investigation Tasks

Indoor air samples will be collected by DOH over a 24-hour period, from July 6 to July 7, 2002. Although background air samples will not be collected as part of this air quality investigation, the literature will be reviewed to estimate typical, urban indoor and outdoor levels of the chemicals of concern. The published background values will be compared to levels detected in indoor air.

The sampling and analysis plan, which is outlined below, was developed by DOH. DOH will contact United Rentals prior to the sampling to obtain access to the property. The air samples will be collected by DOH using air sampling equipment supplied by Data Chem, Inc. of Salt Lake City, Utah. Data Chem will analyze the air samples at their own laboratory.

The analytical results of the indoor air testing will be evaluated by DOH to determine whether levels of chemicals detected inside United Rentals pose a threat to human health through the inhalation route of exposure. A health consultation report will be prepared by DOH, in cooperation with ATSDR, summarizing the results of the evaluation. The results will also be summarized in the final public health assessment being prepared by DOH for the Hamilton/Labree Roads groundwater contamination site. If sampling reveals chemicals in indoor air at levels of health concern, DOH will work with EPA to coordinate appropriate response actions. Actions could include source control and/or exposure reduction, health education, or other actions, if necessary.

Exposure Investigation Sampling and Analysis Plan

The sampling and analysis plan provides detailed guidance for sampling and other data gathering methods to be used during the indoor air sampling.

Site Background

Subsurface environmental investigations conducted since 1993 revealed PCE and lower levels of other VOCs in groundwater and soil in the immediate vicinity of United Rentals property. This is one of two PCE source areas currently being investigated by the EPA. The most significant contamination is in the shallow groundwater, at depths as shallow as a few feet below ground surface (bgs). DOH modeling conducted during the public health assessment indicated the potential for elevated levels of PCE, and to a lesser extent, PCE degradation products, in indoor air in the vicinity of this business.

Sampling Objectives

The objective of the indoor air sampling is to obtain 24-hour air samples from United Rentals, situated above an area of significant groundwater contamination, or "hot spot." The indoor air sampling results will be evaluated by DOH to determine whether people who work inside the business are being exposed to harmful levels of contaminants in the air. The data will also be used by EPA to evaluate the need for follow up air sampling at these, and other area locations.

Sample Location and Frequency

Two indoor air samples will be collected from United Rentals. The specific sampling locations were determined during a previous site-scoping visit, and include the front counter and the main shop work area. The canister intakes will be set at a height that corresponds to the general breathing zone within these rooms.

Quality Control Sample

A separate (3rd) canister will serve as a quality control sample, or field blank. This canister will be transported to and from the site, unopened, and then shipped back to the lab, along with the other two canisters. The purpose of this canister is to assure that no other contaminants were introduced during transportation. The lab will analyze air from this canister using the same method as the other canisters. The results will be included in the analytical report.

Table 2. Indoor Air Sampling Locations and Times

Sample Number	Sample Location	Sampling Start/Stop Time	Sampling Dates
U.R. Counter	Behind front counter	approx. 10:00 AM	July 6-7, 2002
U.R. Shop	Main shop work area	approx. 10:00 AM	July 6-7, 2002
Field Blank	Main shop work area	approx. 10:00 AM	July 6-7, 2002

Sample Designation

The sample designations were preassigned for each indoor air sample as shown on Table 2.

Sampling Equipment and Procedures

The indoor air samples will be collected using SilcoCan 6-L, stainless steel canisters with a passive flow regulator. The canisters will be evacuated to a pressure that, in conjunction with the pre-set flow regulator, draws for 24-hours. Sampling instructions, provided by Data Chem, Inc. are included as Appendix C.

Sample Analysis

Samples will be analyzed for VOCs by EPA Method TO-15, which includes a list of 65 chemical analytes. PCE and PCE degradation products (trichloroethylene, dichloroethylene, and vinyl choride) will be analyzed using the SIM mode, in order to achieve lower detection limits. The other chemicals will be analyzed by the normal SCAN mode. Since PCE and PCE degradation products are the primary chemicals of concern, DOH requested that the lab only report the results of these chemicals. Should other chemicals be detected at elevated levels, the lab will report those as well. The complete analysis results will remain on file at the lab.

Documentation

Photographs will be taken of each sample location. Details such as sample location descriptions, sample identification numbers, canister numbers, sample times and date, use and presence of chemicals, meteorological conditions, and other relevant information will be recorded in a field log, and on the laboratory data sheets. Copies of the laboratory data sheets will be retained for DOH's records.

Data Quality Assessment

In addition to the laboratory analysis report for the field samples, Data Chem will include the results of the method blank, laboratory control duplicate, and surrogate analysis. No additional laboratory data validation is anticipated.

Schedule

The indoor air sampling will be conducted on July 6, 2002, and terminated on July 7, 2002.

Project Organization and Responsibility

DOH is the lead for the exposure investigation, and will conduct the indoor air sampling. Data Chem, Inc. Is providing the sampling equipment and will analyze the samples. DOH, in cooperation with ATSDR, will review and evaluate the data and prepare the health consultation report.

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Conclusions

1. Elevated levels of PCE and other VOCs are present in shallow groundwater in the immediate vicinity of the United Rentals property, and other area locations.

2. Air modeling conducted by DOH indicates the levels of chemicals present in the shallow groundwater have the potential to migrate into the indoor air of United Rentals at levels of potential health concern.

3. No data currently exists to determine whether PCE and PCE-related chemicals may be present in indoor air at United Rentals at levels of health concern. As a result, an indeterminate health risk exists for employees who work there.

Recommendations/Action Plan

1. Indoor air sampling should be conducted inside United Rentals to evaluate the levels (if any) of PCE and PCE related VOCs.

2. DOH will evaluate the indoor air sampling results, and recommend actions to reduce or eliminate exposures, if necessary. Recommendations could also include further source characterization, source control, ventilation, and/or additional indoor air sampling. Sampling results will be provided to United Rentals, Lewis County Environmental Health, EPA, and ATSDR.

Preparer of Report

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References

1. Washington State Department of Ecology. *Source Investigation Report for Hamilton/Labree Roads Chlorinated Solvent Site, Chehalis, Washington*. January 1999.

2. United States Environmental Protection Agency Region 10: Superfund Technical Assessment and Response Team. *Hamilton-Labree Phase IV Removal Assessment Report, Chehalis, Washington*. January 2002.

3. Site visit to United Rentals. June 17, 2002.

4. Personal communication with Dan Sweeney, Environmental Manager, United Rentals. May/June 2002.

5. Personal communication with Lynn Wilder and Cliff Moseley, Agency for Toxic Substances and Disease Registry. June 2002.

Appendix A
Figures

Appendix B
Consent Form

United Rentals
281 Hamilton Road North
Chehalis, Washington 98532

I hereby consent to employees of the Washington State Department of Health (DOH) access to the property indicated above for the collection of indoor air samples.

I understand that DOH is working in conjunction with the Agency for Toxic Substances and Disease Registry (ATSDR), and that these agencies are acting under mandates provided under state and federal law.

I am the property owner, or an individual having authority or the authorization of the property owner, to make this access agreement.

This written permission is given by me voluntarily, with full knowledge of my rights to refuse and without threats or promises of any kind.

Name

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Signature Date

Appendix C
Instructions for Sampling
DataChem Laboratories, Inc.

Appendix D
Field Data Collection/Chain-of-Custody Record

Certification

This health consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the exposure investigation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation report and concurs with the findings.

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